U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-255 253

REPORT ON ULTRA-HAZARDOUS SUBSTANCES AT FEDERAL INSTALLATIONS IN COLORADO

ENVIRONMENTAL PROTECTION AGENCY

18 APRIL 1972

210084

PB 255 253

Report on Ultra-Hazardous Substances at Federal Installations in Colorado

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

Environmental Protection Agency
Region VIII

April 18, 1972

BIBLIOGRAPHIC DATA SHEET	1. Report No.	2.	3. Recipient's Accession No. PB-255 253
4. Title and Subtitle Report on Ultra-Hazardous Substances at Federal Installations in Colorado.			5. Report Date 18 April 1972 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Environmental Protection Agency, Denver, Colo. Region VIII.			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered 14.

15. Supplementary Notes

16. Abstracts

The findings of this report are based totally upon the information which was submitted in good faith by the various Federal offices. The Environmental Protection Agency made no attempt to verify or corroborate the information submitted. The hazardous substances reported fell into three categories: chemical and biological warfare agents, radioactive materials, and conventional explosive weapons and the chemicals involved in preparing them. The Federal installations reporting ultra-hazardous substances presented in this report are the following: Rocky Mountain Arsenal; AEC Rocky Flats Plant; Pueblo Army Depot; Fort Carson; AEC Grand Junction Compound; and Buckley Air National Guard Base.

A complete assessment of the risks involved to the general population must await a further evaluation of current procedures for storing, handling, using and ultimately disposing of these substances. The degree of risk can best be formulated in terms of a "maximum probable occurrence." since leakage, explosions, fires, or other disasters involving these substances would most likely affect only a portion of the total amount of the substance listed, and under abnormal circumstances that do not occur with much frequency. The question that has to be answered through some open public decision-making process, is whether that risk is worth taking, particularly when these substances are located in densely populated urban areas.

17. Key Words and Document Analysis. 17a. Descriptors

*Hazardous materials, Military chemical agents, Solid waste disposal,
*Military facilities, Bibliogical agents, Risks,
*National government, Radioactive materials, Government policies,
*Inventories, Explosives, Regulations,
*Colorado, Air pollution abatement, Pesticides,
Water pollution abatement, Materials handling.

17b. Identifiers/Open-Ended Terms

Contingency planning

17c. COSATI Field/Group 13 B, 7D, 15B,

18. Availability Statement National Technical Information Service Springfield, Va.	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 34
	20. Security Class (This Page) UNCLASSIFIED	22. Price PC$4.00/MF$2.25

FORM NTIS-35 (REV. 10-73) ENDORSED BY ANSI AND UNESCO. THIS FORM MAY BE REPRODUCED USCOMM-DC 8265-P74

INSTRUCTIONS FOR COMPLETING FORM NTIS-35 (Bibliographic Data Sheet based on COSATI Guidelines to Format Standards for Scientific and Technical Reports Prepared by or for the Federal Government, PB-180 600).

1. **Report Number.** Each individually bound report shall carry a unique alphanumeric designation selected by the performing organization or provided by the sponsoring organization. Use uppercase letters and Arabic numerals only. Examples FASEB-NS-73-87 and FAA-RD-73-09.

2. Leave blank.

3. **Recipient's Accession Number.** Reserved for use by each report recipient.

4. **Title and Subtitle.** Title should indicate clearly and briefly the subject coverage of the report, subordinate subtitle to the main title. When a report is prepared in more than one volume, repeat the primary title, add volume number and include subtitle for the specific volume.

5. **Report Date.** Each report shall carry a date indicating at least month and year. Indicate the basis on which it was selected (e.g., date of issue, date of approval, date of preparation, date published).

6. **Performing Organization Code.** Leave blank.

7. **Author(s).** Give name(s) in conventional order (e.g., John R. Doe, or J. Robert Doe). List author's affiliation if it differs from the performing organization.

8. **Performing Organization Report Number.** Insert if performing organization wishes to assign this number.

9. **Performing Organization Name and Mailing Address.** Give name, street, city, state, and zip code. List no more than two levels of an organizational hierarchy. Display the name of the organization exactly as it should appear in Government indexes such as Government Reports Index (GRI).

10. **Project/Task/Work Unit Number.** Use the project, task and work unit numbers under which the report was prepared.

11. **Contract/Grant Number.** Insert contract or grant number under which report was prepared.

12. **Sponsoring Agency Name and Mailing Address.** Include zip code. Cite main sponsors.

13. **Type of Report and Period Covered.** State interim, final, etc., and, if applicable, inclusive dates.

14. **Sponsoring Agency Code.** Leave blank.

15. **Supplementary Notes.** Enter information not included elsewhere but useful, such as: Prepared in cooperation with . . . Translation of . . . Presented at conference of . . . To be published in . . . Supersedes . . . Supplements . . . Cite availability of related parts, volumes, phases, etc. with report number.

16. **Abstract.** Include a brief (200 words or less) factual summary of the most significant information contained in the report. If the report contains a significant bibliography or literature survey, mention it here.

17. **Key Words and Document Analysis. (a). Descriptors.** Select from the Thesaurus of Engineering and Scientific Terms the proper authorized terms that identify the major concept of the research and are sufficiently specific and precise to be used as index entries for cataloging.
(b). Identifiers and Open-Ended Terms. Use identifiers for project names, code names, equipment designators, etc. Use open-ended terms written in descriptor form for those subjects for which no descriptor exists.
(c). COSATI Field Group. Field and Group assignments are to be taken from the 1964 COSATI Subject Category List. Since the majority of documents are multidisciplinary in nature, the primary Field/Group assignment(s) will be the specific discipline, area of human endeavor, or type of physical object. The application(s) will be cross-referenced with secondary Field/Group assignments that will follow the primary posting(s).

18. **Distribution Statement.** Denote public releasability, for example "Release unlimited", or limitation for reasons other than security. Cite any availability to the public, other than NTIS, with address, order number and price, if known.

19 & 20. **Security Classification.** Do not submit classified reports to the National Technical Information Service.

21. **Number of Pages.** Insert the total number of pages, including introductory pages, but excluding distribution list, if any.

22. **NTIS Price.** Leave blank.

Report on Ultra-Hazardous Substances at Federal Installations in Colorado

Environmental Protection Agency
Region VIII
April 18, 1972

ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
SUITE 900 1860 LINCOLN STREET
DENVER COLORADO 80203

April 18, 1972

Honorable John A. Love
Governor of Colorado
Denver, Colorado 80203

Dear Governor Love:

We are pleased to transmit the "Report on Ultra-Hazardous Substances at Federal Installations in Colorado." This report was prepared by our staff in response to your request of November 23, 1971, to John A. Green, Regional Administrator, for information on the subject.

As you know, on December 30, 1971, we transmitted to you the "Preliminary Report on Potentially Hazardous Materials at Federal Installations in Colorado." That report was quite detailed and contained an inventory not only of ultra-hazardous substances, but of substances in normal, everyday use at Federal installations for scientific, research, operation, and maintenance activities. The report transmitted herewith deals exclusively with ultra-hazardous substances such as chemical and biological warfare agents, radioactive materials, and explosives which are not normally found in regular commercial, industrial, or household activities.

The Colorado Department of Health provided us with valuable assistance in compiling this final report. We anticipate working closely with the Department in the near future to implement the recommendations of the report.

Sincerely yours,

Donald P. Dubois
Deputy Regional Administrator

Report on Ultra-Hazardous Substances at Federal Installations in Colorado

I. Background

The Department of the Army recently released a draft environmental impact statement in accordance with the National Environmental Policy Act which discussed a proposal to dispose of mustard gas being stored at the Pueblo Army Depot in Colorado. Neither the Governor of Colorado nor any other Colorado State officials had any knowledge that mustard gas was being stored at that particular facility.

As a result of this discovery, Governor Love of Colorado on November 23, 1971, requested that the Region VIII office of the Environmental Protection Agency act as the Federal Coordinator in developing an inventory of hazardous substances used, stored, or handled at Federal facilities located in Colorado. The Regional Administrator of the Environmental Protection Agency, Mr. John A. Green, agreed to work with other Federal agencies in compiling such an inventory for Governor Love.

Federal agencies are required by the provisions of Executive Order 11507, dated February 4, 1970, to prevent, control and abate air and water pollution at Federal facilities and to seek technical assistance from the Environmental Protection Agency. Section 4(a)(4) of that Executive Order provides as follows:

> The use, storage, and handling of all materials including but not limited to, solid fuels, ashes, petroleum products, and other chemical and biological agents shall be carried out so as to avoid or minimize the possibilities for water and air pollution. When appropriate, preventive measures shall be taken to entrap spillage or discharge or otherwise to prevent accidental pollution. Each agency, in consultation with the [Administrator], shall establish appropriate emergency plans and procedures for dealing with accidental pollution.

Relying upon the mandate and authority of that particular section of the Executive Order, EPA sent a letter dated November 24, 1971 (see Appendix A) to each of the Federal offices listed in Appendix A. A similar letter, dated December 2, 1971, (see Appendix A) was sent to several Federal offices which EPA had not contacted by Mr. Robert E. Waggoner, Chairman, Denver Federal Executive Board. The letters requested that the Federal offices

provide EPA with an inventory of the types, quantities and locations of all hazardous substances used, stored or handled by those Federal offices in the State of Colorado.

It is obvious that virtually any substance is potentially hazardous, depending on the properties and effects of the substance and the times, locations, quantities and circumstances of use.

There are approximately 4-1/2 million chemical substances known today. New chemicals are being developed at the rate of several thousand per year, of which about 500 are marketed in production quantities. Often substances normally used in the home, in industry and in government activities can cause serious environmental problems if not properly stored, handled, used and disposed.

The following broad definition of the term "hazardous substance" was provided to Federal offices as guidance in compiling their inventory:

> hazardous substance - any substance which possesses the potential for presenting an imminent and substantial danger to the public health or welfare (including fish, shellfish, wildlife, plant life, and public and private property.)

This definition required a detailed listing, including these types and quantities of hazardous substances in normal, everyday use at Federal installations for scientific, research, operation and maintenance activities.

A suggested list of potentially hazardous substances was provided to each Federal office (see Appendix B). It was made clear that the suggested list was not intended to be all-inclusive. Substances were included on the suggested list if they possess properties which make them either biologically accumulative, lethal, highly biodegradable, corrosive, radioactive or growth inhibiting or stimulating.

On the basis of this definition, every Federal office which was contacted responded with detailed listings of such hazardous substances. This information was compiled into a report entitled "A Preliminary Report on Potentially Hazardous Materials at Federal Installations in Colorado," that was transmitted to Governor Love on December 30, 1971. The report is on file with the Colorado Department of Health. It contains an exhaustive summary of all hazardous substances reported by each Federal facility.

It was recognized that the above definition of the term "hazardous substance" was much broader than the definition intended by Governor Love when he requested an inventory. Governor Love's prime concern was with those types and quantities of hazardous substances not normally found in regular commercial, industrial or household activities. For this reason, this report of a more selective nature has been prepared to respond to Governor Love's specific request.

Accordingly, the following definition of the term "ultra-hazardous substance" will be used for the purposes of this report:

> ultra-hazardous substance - any type or quantity of substance which possesses the potential for presenting an imminent and substantial danger to the public health or welfare (including fish, shellfish, wildlife, plant life and public and private property) and which is not normally found in regular commercial, industrial or household activities.

Classified Substances

It was recognized that certain potentially hazardous substances used, stored or handled at Federal facilities might be classified for national security purposes. It was suggested to the Federal offices that classified information be transmitted by confidential written or verbal communication directly with the Governor or by written communication transmitted to the Governor through EPA personnel holding appropriate clearances.

II. Findings

The findings of this report are based totally upon the information which was submitted in good faith by the various Federal offices and is contained in the Preliminary Report. The Environmental Protection Agency made no attempt to verify or corroborate the information submitted.

The substances reported fell into three categories: chemical and biological warfare agents, radioactive materials, and conventional explosive weapons and the chemicals involved in preparing them.

The Federal installations reporting ultra-hazardous substances presented in this report are the following:

Rocky Mountain Arsenal
AEC Rocky Flats Plant

Pueblo Army Depot
Fort Carson
AEC Grand Junction Compound
Buckley Air National Guard Base

It must be emphasized that the dangers presented to the public health or welfare from these substances at Federal installations are potential dangers only. The actual dangers need never be realized if proper precautionary procedures are diligently observed during the production, storage, handling, transportation, use and ultimate disposal of these substances.

A complete assessment of the risks involved to the general population must await a further evaluation of current procedures for storing, handling, using and ultimately disposing of these substances. The degree of risk can best be formulated in terms of a "maximum probable occurrence," since leakage, explosions, fires, or other disasters involving these substances would most likely affect only a portion of the total amount of the substance listed, and under abnormal circumstances that do not occur with much frequency.

But there is always a risk of danger involved when dealing with these ultra-hazardous substances, however small that risk might be. The question that has to be answered through some open public decision-making process, is whether that risk is worth taking, particularly when these substances are located in densely populated urban areas.

LISTING OF ULTRA-HAZARDOUS SUBSTANCES AT FEDERAL INSTALLATIONS

The following are the lists of ultra-hazardous substances by installation. Where reported, information as to use, chemical formula, amounts, and mode of storage of the ultra-hazardous substance is presented.

A. ROCKY MOUNTAIN ARSENAL

Name	Use	Chemical Name	Method of Storage and/or Facility	Amount
SARIN(GB)	CBW 1/	methylisopropoxyflouro-phosphine oxide	1/2 ton bombs (M34)	21,104 bombs (463,000 gallons
PHOSGENE	CBW	carbonyl chloride	1 ton containers	1,294 cont. (2,588,000 lb.)
MUSTARD	CBW	2-2'-dichloro diethylsulfide (Levenstein)	1 ton containers	2,456 cont. (3,940,000 lb.)
MUSTARD	CBW	2-2'-dichloro diethylsulfide (distilled)	1 ton containers	951 cont. (1,520,000 lb.)
WHEAT-STEM RUST	ANTI-CROP AGENT		no further information reported	
DISTILLED 2/ MUSTARD (HD)	CBW	-	-	1/2 oz (Fluid)

1/ CBW - Chemical and Biological Warfare agent

2/ Stored at the Arsenal for Lowry Air Force Base. Even small quantities of this concentrate are dangerous.

B. AEC ROCKY FLATS PLANT

Substance	Quantity
Plutonium	large amounts 1/
Uranium	large amounts 1/
Beryllium	3,300 pounds
Chlorine	2,250 pounds
Mercury	1,274 pounds
Oil, polychlorinated biphenyls	10,043 gallons

1/ Quantitative information is classified.

C. PUEBLO ARMY DEPOT

Name	Use	Chemical Name	Method of Storage and/or Facility	Amount
O-chlorobenzal-malonitrile	(tear agent, CS)		Acid Yard	Grenades 512 (128 lb.)
"	"	"	" "	Hand Grn. 2108 rds (592 lb.)
"	"	"	" "	40 mm Sh.47,125 rds. (5654 lb.)
Mustard Gas	CBW	2-2' dichloro-diethyl sulfide	" "	4.2" shells classified
" " "	"	" "	" "	105,155 mm projectiles classified
Ethylene oxide	Manufacturing chemical	"		-- 7525 lb.
High Explosives	Warfare	conventional	Assorted	400,000,000 lb.
Hydrazine	Warfare Rocket Fuel	UMDH, unsymmetrical dimethylhydrazine	Ammunition Div.	774 lb.
Hydrazine 17%	Component of M3 fuel	UMDH	" "	897 lb.
Hydrazine 7%	Component of M2 fuel		" "	1297 lb.
Naphthenic acid,25%	Component of M1 oil thickener Napalm preparation	Incendiary	" "	26760 lb.
Nitric Acid	manufacturing explosives	RFNA red fuming nitric acid	" "	360,498 lb.
Nitric Acid	"	" " "	" "	4,840 lb.
Oleic acid, 25%	component of M1 incendiary oil thickener		Acid Yard Property Disposal Office	26,760 lb.

PUEBLO ARMY DEPOT, CONTD.

Name	Use	Chemical Name	Method of Storage and/or Facility	Amount
White phosphorous	explosive chemical warfare agent rocket fuel		Acid Yard Property Disposal Office	(79 lb.)
"	"	"	"	Hand Grenade 185 rds. (174 lb.)
"	"	"	"	2.5" rocket 1270 rds. (1732 lb.)
"	"	"	"	Bomb,igniter 82 each (103 lb.)
White phosphorous, explosive, etc.			Ammunition Div.	155 mm, WP (755,835 lb.)
"	"	"	"	105 mm, WP (45,084 lb.)
"	"	"	"	76, 81, 75, 90 mm WP (139,559 lb.)
Mercury, elemental			GSA stocks	classified

D. FORT CARSON

Substance	Quantity
red phosphorous	no quantities reported
white phosphorous	no quantities reported

Fort Carson provided an extensive list of chemicals, some of which could be considered ultra-hazardous in sufficient quantity, and others which appeared to be used for military training purposes. More information is needed to adequately evaluate their hazard potential. This list is contained in the Preliminary Report.

E. AEC GRAND JUNCTION COMPOUND

Name	Use	Method of Storage	Amount
Uranium oxide concentrate	Uranium processing	55-gallon drums stored outside and in two steel buildings	33,000 tons
Lignite uranium bearing ore		buried at north end of large uranium tailing pile	300 tons
Uranium ore tailings		Stabilized tailings piles	20,000 tons
Contaminated equipment		buried in above piles	50 tons

F. BUCKLEY AIR NATIONAL GUARD BASE

Name	Quantity
DOT Class A Explosive	100-400 lb.
DOT Class B Explosive	10,000 lb.
DOT Class C Explosive	100-400 lb.
DOT Class B Explosive/Class C Poison (tear gas)	4,500 lb.

III. Recommendations

1. State agencies, the Environmental Protection Agency and the Federal offices reporting ultra-hazardous substances should work closely to assess present procedures for the safe storage, handling and disposal of these substances; develop improved procedures for preventing and minimizing mishaps; and develop coordinated contingency plans for coping with emergency situations as they might occur. Emphasis should be directed toward establishing contingency plans for coping with maximum emergency situations, including information on poison antidotes; decontaminants; cleanup; disaster warning and coordination with private, local, State and Federal entities; compensations; and long-range planning efforts to minimize risks in view of urban proximity to such installations.

2. Procedures should be established for the Federal offices using, storing or handling ultra-hazardous substances in the State of Colorado to promptly notify State agencies and the Environmental Protection Agency whenever a new ultra-hazardous substance or substantially increased quantities of exisitng ultra-hazardous substances are located in the State.

3. Coordinated private, local, State, and Federal efforts should be initiated to inventory not only ultra-hazardous substances, but all hazardous substances used in industrial, commercial, governmental and domestic activity in the State. These efforts should assess present procedures for the safe transportation, storage, handling, use, and disposal of hazardous substances; develop improved procedures for preventing and minimizing mishaps; and develop coordinated contingency plans for coping with emergency situations as they might occur.

4. The State of Colorado should deal directly with the Department of Defense, Atomic Energy Commission or other Federal offices regarding further information on classified types and quantities of substances.

APPENDIX A

Letters Sent to Federal Offices and List of Federal Offices Contacted

ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
SUITE 900, 1860 LINCOLN STREET
DENVER, COLORADO 80203

A-1

November 24, 1971

Lt. General A. D. Surles, Jr.
Commanding General
Sixth United States Army
Presidio of San Francisco
California 94129

Dear Lt. General Surles:

On November 23, 1971, Governor Love of Colorado requested that this office act as the Federal Coordinator in developing an inventory of hazardous substances used, stored, or handled at Federal facilities located in the State of Colorado. I have consented to work with the Governor in compiling such an inventory of hazardous substances. This activity is in accordance with our responsibilities under Executive Order 11507. The Governor's request was in response to his discovery that mustard gas was being stored at the Pueblo Army Depot unbeknown to Colorado State officials.

Accordingly, you are requested to provide this office by December 10, 1971, with a list of the types, quantities and locations of all hazardous substances used, stored or handled at any Federal facility located in Colorado for which your agency is responsible. If for some reason you cannot comply with this request by December 10, please send me a letter outlining the difficulties you are experiencing and your estimate of when you can provide the requested information. A list of the Federal agencies which I am contacting is attached.

Section 4(a)(4) of Executive Order 11507, dated February 4, 1970, addresses the prevention, control and abatement of air and water pollution at Federal facilities as follows:

> "The use, storage, and handling of all materials, including but not limited to, solid fuels, ashes, petroleum products, and other chemical and biological agents, shall be carried out so as to avoid or minimize the possibilities for water and air pollution. When appropriate, preventive measure shall be taken to entrap spillage or discharge or otherwise to prevent accidental pollution. Each agency, in consultation with the respective Secretary, shall establish appropriate emergency plans and procedures for dealing with accidental pollution."

An inventory of hazardous substances is a necessary first step in the development of an effective contingency plan to prevent and control spills of these substances. Since the Environmental Protection Agency is now responsible for providing assistance to Federal agencies under this Executive Order, we will be working with you in the near future on the development of such contingency plans for your facilities.

Any substance is potentially hazardous, depending on the properties and effects of the substance and the times, locations, quantities and circumstances of discharge. To aid you in defining the scope of your inventory, I have attached a list of hazardous substances which we feel possess the potential for presenting an imminent and substantial danger to the public health or welfare (including fish, wildlife and public and private property, shorelines and beaches). This list is merely suggestive and is not all inclusive. These substances are listed because they possess properties which make them either biologically accumulative, lethal, highly biodegradable, corrosive, radioactive or growth inhibiting or stimulating. Included in your inventory should be other chemical or biological agents such as war gases which possess similarly dangerous properties.

Your cooperation in satisfying this request is appreciated. Please contact us if you have any questions regarding the request.

Sincerely yours,

John A. Green
Regional Administrator

Enclosures (2)

A-3

DENVER FEDERAL EXECUTIVE BOARD

BUILDING 41
DENVER FEDERAL CENTER
DENVER, COLORADO 80225
TELEPHONE: 233-3611, Ext. 8215

Robert E. Waggoner
Chairman

Jack W. Ball
Vice-Chairman

Geraldine N. Brady
Executive Assistant

POLICY COMMITTEE
Maurice D. Arnold
Donald G. Eddy
G. Lewis Frazer
James C. Gaskin
David G. Harrison
Betty Higby
Chester A. Jones
Samuel R. Martinez
William H. Rima, Jr.
William J. Lucas

2 December 1971

TO: DFEB Members

SUBJECT: Hazardous Substances Used, Stored, or Handled at Federal Facilities Located in Colorado

On November 23, 1971, Governor Love requested that the Environmental Protection Agency, Region VIII, act as the Federal Coordinator in developing an inventory of hazardous substances used, stored, or handled at Federal facilities located in the State of Colorado. Mr. John Green, Regional Administrator, Region VIII, consented to work with the Governor in compiling such an inventory of hazardous substances. The Governor's request was in response to his discovery that mustard gas was being stored at the Pueblo Army Depot without knowledge of Colorado State officials.

In an effort to be of assistance in this project, the DFEB is canvassing its membership, not otherwise contacted by the Environmental Agency. Accordingly, you are requested to provide the Environmental Agency by December 10, 1971, with a list of the types, quantities and locations of all hazardous substances used, stored, or handled at any Federal facility located in Colorado for which your agency is responsible. If for some reason you cannot comply with this request by December 10, please send a letter to Jack Green outlining the difficulties you are experiencing and your estimate of when you can provide the requested information.

The following is taken from Jack Green's letter of November 24, 1971, to various Federal Agencies:

"Section 4(a)(4) of Executive Order 11507, dated February 4, 1970, addresses the prevention, control and abatement of air and water pollution at Federal facilities as follows:

> 'The use, storage, and handling of all materials, including but not limited to, solid fuels, asnes, petroleum products, and other chemical and biological agents, shall be carried out so as to avoid or minimize the possibilities for water

and air pollution. When appropriate, preventive measure shall be taken to entrap spillage or discharge or otherwise to prevent accidental pollution. Each agency, in consultation with the respective Secretary, shall establish appropriate emergency plans and procedures for dealing with accidental pollution.'

An inventory of hazardous substances is a necessary first step in the development of an effective contingency plan to prevent and control spills of these substances. Since the Environmental Protection Agency is now responsible for providing assistance to Federal agencies under this Executive Order, we will be working with you in the near future on the development of such contingency plans for your facilities."

Please keep in mind that any substance is potentially hazardous, depending on the properties and effects of the substance and the times, locations, quantities and circumstances of discharge. You will want to list any substances which possess properties which make them either biologically accumulative, lethal, highly biodegradable, corrosive, radioactive or growth inhibiting or stimulating. Included in your inventory should be other chemical or biological agents such as war gases which possess similarly dangerous properties.

We appreciate your cooperation in this matter. Please contact us if you have any questions regarding this request.

Sincerely,

Bob Waggoner

ROBERT E. WAGGONER
Chairman

FEDERAL AGENCIES REQUESTED TO FURNISH INVENTORY OF HAZARDOUS SUBSTANCES LOCATED IN COLORADO

Management Services Division
Agriculture Research Service
U.S. Department of Agriculture
Denver, Colorado

Management Services Division
Agriculture Research Service
U.S. Department of Agriculture
Fort Collins, Colorado

Regional Forester
Rocky Mountain Region
Forest Service
U.S. Department of Agriculture
Denver, Colorado

State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
Denver, Colorado

District Engineer
Sacramento District
U. S. Army Corps of Engineers
Sacramento, California

District Engineer
Albuquerque District
U.S. Army Corps of Engineers
Albuquerque, New Mexico

District Engineer
Tulsa District
U.S. Army Corps of Engineers
Tulsa, Oklahoma

District Engineer
Kansas City District
U.S. Army Corps of Engineers
Kansas City, Missouri

District Engineer
Omaha District
U.S. Army Corps of Engineers
Omaha, Nebraska

Commanding General
Sixth United States Army
San Francisco, California

Commandant
9th Naval District
Great Lakes, Illinois

Commander
Lowry Air Force Base
Denver, Colorado

Base Commander
Ent Air Force Base
Colorado Springs, Colorado

Superintendent
U.S. Air Force Academy
Colorado

Base Commander
Colorado Air National Guard
Buckley ANG Base
Aurora, Colorado

Regional Director
Central Region
National Weather Service - NOAA
Kansas City, Missouri

Director
Environmental Research Laboratories
National Oceanic and Atmospheric Admin.
Boulder, Colorado

Deputy Director
National Bureau of Standards
Boulder, Colorado

Bureau Safety Officer
U.S. Geological Survey
Denver, Colorado

Area Director
Albuquerque Area Office
Bureau of Indian Affairs
Albuquerque, New Mexico

Regional Director
Mid-Continent Region
Bureau of Outdoor Recreation
Denver, Colorado

Director
Region 4
Bureau of Reclamation
U.S. Department of the Interior
Salt Lake City, Utah

Director
Region 5
Bureau of Reclamation
U.S. Department of the Interior
Amarillo, Texas

Director
Region 7
Bureau of Reclamation
U.S. Department of the Interior
Building 20, Denver Federal Center
Denver, Colorado 80225

Director
Engineering and Research Center
Bureau of Reclamation
U.S. Department of the Interior
Denver, Colorado

Director
Mid-West Region
National Park Service
U.S. Department of the Interior
Omaha, Nebraska

Acting Chief
Western Administrative Office
Bureau of Mines
U.S. Department of the Interior
Denver, Colorado

Director
Colorado State Office
Bureau of Land Management
U.S. Department of the Interior
Denver, Colorado

Director
Denver Service Center
Bureau of Land Management
U.S. Department of the Interior
Denver, Colorado

Director
Region 2
Bureau of Sport Fisheries and Wildlife
Fish and Wildlife Service
Albuquerque, New Mexico

Regional Administrator
Dept. of Housing and Urban Development
Denver, Colorado

Regional Post Master General
Western Region
U.S. Postal Service
San Francisco, California

Special Agent In Charge
Federal Bureau of Investigation
Denver, Colorado

Correctional Program Officer
Bureau of Prisons
U.S. Department of Justice
Denver, Colorado

Regional Director
Bureau of Narcotics and Dangerous Drugs
Denver, Colorado

Regional Manpower Administrator
Manpower Administration
U.S. Department of Labor
Denver, Colorado

Regional Administrator
Occupational Safety and Health Administration
U.S. Department of Labor
Denver, Colorado

Acting Regional Administrator
Federal Highway Administration
U.S. Department of Transportation
Denver, Colorado

Regional Director
Federal Aviation Administration
U.S. Department of Transportation
Aurora, Colorado

Commander
2nd Coast Guard District
St. Louis, Missouri

Superintendent
United States Mint
Denver, Colorado

Area Supervisor
Alcohol and Tobacco Tax Division
Internal Revenue Service
Denver, Colorado

INDEPENDENT FEDERAL AGENCIES

General Manager
U.S. Atomic Energy Commission
Washington, D.C.

Regional Administrator
General Services Administration
Denver, Colorado

Director
Veterans Administration Hospital
Denver, Colorado

Director
Veterans Administration Hospital
Grand Junction, Colorado

Director
Veterans Administration Hospital
Fort Lyons, Colorado

APPENDIX B

Suggested List of Potentially Hazardous Substances

SUGGESTED LIST OF
POTENTIALLY HAZARDOUS
SUBSTANCES

B-1

Reproduced from
best available copy.

(a) The elements, compounds, ions or mixtures listed below, or mixtures or compounds thereof, are designated as hazardous substances when discharged in any quantity since they possess a high potential for presenting an imminent and substantial danger to the public health or welfare for which no safe limit can be established because of their non-degradable or persistent nature, or because they can be biologically magnified, or because they otherwise cause or tend to cause detrimental cumulative effects:

aldrin
DDE
DDT
dieldrin
TDE (DDD)
toxaphene
heptachlor
mercury
polychlorinated biphenyls (PCB's)

(b) (1) The elements, compounds or their isomers, ions or mixtures listed below, or mixtures or compounds thereof, may present an imminent and substantial danger to the public health or welfare because of lethal, corrosive, irritating, strongly sensitizing, highly biodegradable, growth inhibiting or stimulating or radioactive properties:

(i) radioactive materials;

(ii) the active ingredients of poisons registered as economic poisons in accordance with the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 135 et seq.)

(iii) and the following:

abietic acid
acetaldehyde
acetamide
acetanilide
acetic acid
acetic anhydride
acetone cyanohydrin
acetonitrile
acetophenone
acetyl bromide
acetylene
acridine
acrylic acid
acrylonitrile
adipic acid
adiponitrile
alkyldimethyl-3,4-dichlorobenzylammonium chloride
alkyldimethylbenzylammonium chloride
alkyldimethylbenzyldimethylammonium chloride
alkylethylbenzyldimethylammonium chloride
allyl alcohol
allyl chloride
aluminum fluoride
aluminum sulfate
aminoethyl ethanol amine
ammonia
ammonium acetate
ammonium carbonate
ammonium chloride
ammonium chromate
ammonium dichromate
ammonium ferricyanide
ammonium ferrocyanide
ammonium nitrate
ammonium perchlorate
ammonium peroxydisulfate
ammonium phosphate
ammonium picrate
ammonium sulfate
ammonium sulfide
ammonium thiocyanate
amyl acetate
aniline
antimony potassium tartrate
antimony trichloride
antimony trifluoride
antimony trioxide

Reproduced from best available copy.

barium chloride
barium cyanide
barium hydroxide
barium nitrate
benzene
benzoic acid
benzonitrile
benzoyl chloride
benzylamine
beryllium chloride
beryllium nitrate
beryllium sulfate
boranes
boric acid
bromine
butyl acetate
butyl acrylate
butyl alcohol
butylamine
butylene glycol
butyl mercaptan
cadmium chloride
cadmium nitrate
cadmium sulfate
calcium carbide
calcium cyanide
calcium hypochlorite
calcium phosphide
carbon disulfide
carbon monoxide
carbon tetrachloride
cetyldimethylammonium bromide
cetyldimethylbenzylammonium chloride
cetylpyridinium chloride
cetyltrimethylammonium bromide
cetyltrimethylethylammonium bromide
chloramine
chlorine
chloroacetic acid
chlorobenzene
chlorobutadiene
chloroform
chloroplatinic acid
chlorosulfonic acid
chlorothiazide
citric acid
cobalt chloride

Reproduced from best available copy.

cobalt nitrate
cobalt sulfate
copper chloride
copper nitrate
copper sulfate
cresol
crotonaldehyde
cyanamide
cyanoacetic acid
cyanobutadiene
cyanogen bromide
cyanogen chloride
cyclohexane
diaminoethane
dianylamine
dibutyl phthalate
dichlorobenzene
dichloroethane
dichloromethane
dichlorophenol
dichloropropane
diethanolamine
diethylamine
diethyl phthalate
diisobutylcresoxyethoxyethyldimethylbenzylammonium chloride
diisobutylphenoxyethoxyethyldimethylbenzylammonium chloride
diisopropanolamine
diisopropylamine
dimethylamine
dimethylbenzylammonium chloride
dimethyl sulfate
dimethyl sulfoxide
dinitrobenzene
dinitrophenol
disodiumdibutylphenylphenoldisulfonate
epichlorohydrin
ethanolamine
ethyl acrylate
ethyl alcohol
ethylamine
ethylbenzene
ethylene
ethylenediaminetetraacetic acid (EDTA)
ethylene glycol
ethylene glycol diacetate
ethylene glycol monobutyl ether
ethyleneimine

Reproduced from best available copy.

ferric hydroxide
ferric chloride
ferric sulfate
ferrous hydroxide
ferrous sulfate
ferrous sulfite
fluorine
formaldehyde
fumaric acid
furfural
furfuryl alcohol
gallic acid
gluconic acid
glucose
glycerol
heptanol
hexamethylene diamine
hexanol
hydrazine
hydrochloric acid
hydrocyanic acid
hydrofluoric acid
hydrogen peroxide
hydroquinone
hydroxylamine
hypochlorous acid
indole
isoprene
lactic acid
lanthanum acetate
lauryldimethylbenzylammonium chloride
lead acetate
lead arsenate
lead chloride
lead nitrate
lead sulfate
lead tetraethyl
lead tetramethyl
linoleic acid
lithium chloride
maleic acid
maleic anhydride
maltose
methanethiol
methanol
methyl acetate
methyl acrylate
methylamine
methyl azide
methylethyl pyridine
methylisobutyl ketone
methylmethacrylate

Reproduced from best available copy.

molasses
molybdic trioxide
mustard gas
naphthalene
naphthalic acid
naphthenic acid
naphthol
naphthylamine
nickel ammonium sulfate
nickel chloride
nickel nitrate
nickel sulfate
nitric acid
nitrilotriacetic acid (NTA)
nitroaniline
nitrobenzene
nitrochlorobenzene
nitrocresol
nitrophenol
nitropropane
nitroxylene
octadecenyldimethylethylammonium bromide
octyl alcohol
oleic acid
oxalic acid
oxydipropionitrile
paraformaldehyde
pentanal
pentene
phenobarbitol
phenol
phenylcarbylamine chloride
phosgene
phosphoric acid
phosphorus
phosphorus oxychloride
phosphorus pentasulfide
phosphorus trichloride
polyglycol ether
potassium chromate
potassium cyanide
potassium dichromate
potassium hydroxide
potassium permanganate
propanal
propanoic acid
propanoic anhydride

Reproduced from best available copy.

propanolamine
propyl alcohol
propylamine
propylene oxide
pyridine
pyrocatechol
pyrogallol
quinacrine hydrochloride
quinhydrone
quinine
quinoline
quinone
resorcinol
salicylaldehyde
salicylic acid
selenium
silver nitrate
sludge, chemical
sludge, digested sewage
sludge, raw, undigested sewage
sodium
sodium anthraquinone sulfonate
sodium arsenate
sodium azide
sodium bisulfite
sodium bromobenzene sulfonate
sodium butyldiphenyl sulfonate
sodium butylphenylphenol monosulfonate
sodium chromate
sodium cyanate
sodium cyanide
sodium decylbenzene sulfonate
sodium dichlorobenzene sulfonate
sodium dichromate
sodium dodecylbenzene sulfonate
sodium ferricyanide
sodium ferrocyanide
sodium fluoride
sodium fluosilicate
sodium hydrosulfide
sodium hydroxide
sodium lauryl sulfate
sodium methylate
sodium naphthalene sulfate
sodium nitrite
sodium nitrochlorobenzene sulfonate
sodium octyl sulfate
sodium oleate

Reproduced from best available copy.

sodium palmitate
sodium phosphate
sodium selenite
sodium silicate
sodium stearate
sodium sulfide
sodium sulfite
sodium thiocyanate
sodium tungstate
stannous chloride
strontium chloride
strontium nitrate
styrene
sulfur chloride
sulfuric acid
sulfurous acid
superphosphate
tannic acid
tetraethylene pentamine
thallic oxide
thallium acetate
thioglycolic acid
thorium chloride
thorium nitrate
titanium chloride
titanium nitrate
titanium sulfate
toluene
toluene diisocyanate
toluidine
trichlorophenol
triethanolamine
triethylamine
triethylenetetramine
trimethylamine
vanadyl sulfate
vinyl acetate
vinyl bromide
vinyl chloride
xylene
xylenol
zinc chloride
zinc nitrate
zinc sulfate
zirconium sulfate

Reproduced from best available copy.